

in COFC

**PATENT**

Practitioner's Docket No. **62002-1751**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Patent Number: **6,852,195**

Issued: **February 8, 2005**

Name of Patentee: **Martin, et al.**

Title of Invention: **Method and Apparatus for Low Energy Electron Enhanced Etching of Substrates in an AC or DC Plasma Environment**

**Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450**

**Attention: Decision and Certificate of Correction  
Branch of the Patent Issue Division**

**REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT  
FOR PTO MISTAKE (37 C.F.R. § 1.322(a))**

1. Attached, in duplicate, is PTO/SB/44 (also Form PTO-1050), with at least one copy being suitable for printing.

*NOTE: Form PTO-1050 (or PTO/SB/44), using the column and line number in the printed patent, should be used exclusively regardless of the length or complexity of the subject matter. M.P.E.P. § 1485, 7<sup>th</sup> ed.*

*NOTE: The patent grant should be retained by the patentee. The PTO does not attach the certificate of correction to the patentee's copy of the patent. The patent grant will be returned to the patentee if submitted. M.P.E.P. § 1485.*

2. Attached is a copy of the PTO-1449 which was initialed by the Examiner on August 13, 2004.
3. The exact page and line number where the errors are shown correctly in the application file are:

*NOTE: This information should be identified in this request; however, on Form PTO-1050, only the column and line number in the printed patent should be used. M.P.E.P. § 1485, 7<sup>th</sup> ed.*

In the Related U.S. Application Data section, please add the following priority information:

Continuation-In-Part of application No. 08/705,902, filed on Aug. 28, 1996, now Pat. No. 5,882,538.

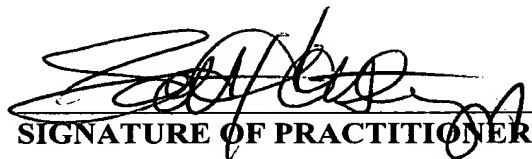
In the (56) References Cited, U.S. Patent Documents, please add the following omitted references on page 2, left column which were considered by the Examiner on August 13, 2004:

5,241,535 8/1993 Yoshikawa 370/60  
5,298,896 3/1994 Lei et al. 341/51  
5,309,232 5/1994 Hartung et al. 348/384  
5,331,249 7/1994 Minamikata et al. 313/632

3. Please send the Certificate to:

Name: **Scott A. Horstemeyer**

Address: Thomas, Kayden,  
Horstemeyer, & Risley, L.L.P.  
100 Galleria Parkway, Suite 1750  
Atlanta, Georgia 30339



SIGNATURE OF PRACTITIONER

**Scott A. Horstemeyer**

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Thomas, Kayden,  
Horstemeyer, & Risley, L.L.P.  
100 Galleria Parkway, Suite 1750  
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Customer No.: 24504

NOTE: The certificate of correction, under 35 U.S.C. 254, may be issued at the request of the patentee or [the patentee's] assignee." 37 C.F.R. §1.322(a). The certificate of correction can be signed by the attorney of record who acts on behalf of the inventor(s) or assignee(s).



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on April 29, 2005.

Anne Antonoff  
Anne Antonoff

In re Patent of: **Martin, et al.**

Our Reference Number: 062002-1751

U.S. Patent No: 6,852,195

Issue Date: February 8, 2005

Title: **METHOD AND APPARATUS FOR LOW ENERGY ELECTRON ENHANCED  
ETCHING OF SUBSTRATES IN AN AC OR DC PLASMA ENVIRONMENT**

The following is a list of documents enclosed:

Return Postcard  
Request for Certificate of Correction  
Certificate of Correction (& Original Duplicate)  
Copy of Form 1449

**UNITED STATES PATENT AND TRADEMARK OFFICE  
CERTIFICATE OF CORRECTION**

Patent No.: 6,852,195  
Dated: February 8, 2005  
Inventor(s): Kevin P. Martin, Harry P. Gillis, and Dmitri A. Choutov

It is certified that error appears in the above-identified patent and that said  
Letters Patent is hereby corrected as shown below

In the Related U.S. Application Data section, please add the following priority  
information:

Continuation-In-Part of application No. 08/705,902, filed on Aug. 28, 1996, now Pat. No.  
5,882,538.

In the (56) References Cited, U.S. Patent Documents, please add the following omitted  
references on page 2, left column which were considered by the Examiner on August  
13, 2004:

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5,298,896 3/1994 Lei et al. 341/51  
5,309,232 5/1994 Hartung et al. 348/384  
5,331,249 7/1994 Minamikata et al. 313/632

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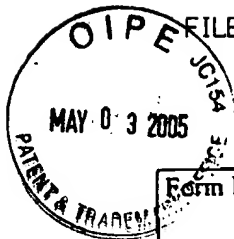
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Form PTO-1449				Attorney Docket No. 062002-1751		Serial No. 09/855,972	
INFORMATION DISCLOSURE CITATION  (Use several sheets if necessary)				Applicant Martin, et al.			
				Filing Date 05/15/2001		Group 3742	
U.S. PATENT DOCUMENTS							
Examiner Initials	Item	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
pt ↓	1A	1,712,407	5/7/1929	Skaupy			8/30/1921
	1B	2,037,075	4/14/1936	Haines	250	27.5	10/25/1933
	1C	3,304,456	2/14/1967	De Lany et al.	313	182	3/4/1963
	1D	3,879,597	4/22/1975	Bersin et al.	219	121	8/16/1974
	1E	4,031,424	6/21/1977	Penfold et al.	313	146	3/3/1975
	1F	4,207,158	6/10/1980	Freeman	204	180	5/18/1979
	1G	4,259,145	3/31/1981	Harper et al.	156	643	6/29/1979
	1H	4,298,443	11/3/1981	Maydan	204	192	12/20/1979
	1I	4,309,267	1/5/1982	Boyd et al.	204	298	7/21/1980
	1J	4,450,787	5/29/1984	Weakliem et al.	118	723	5/29/1984
	1K	4,496,881	1/29/1985	Cheever	315	357	9/29/1982
FOREIGN PATENT DOCUMENTS							
		Document Number	Date	Country	Class	Subclass	Translation Yes No
	1L						
	1M						
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)							
pt ↓	1N	P. Breisacher et al. "Comparative Stabilities of Gaseous Alane, Gallane and Indane" Journal of the American Chemical Society pp. 4255-4258 87:19 Oct 5, 1965.					
	1O	S. Veprek et al. "The Preparation of Thin Layers of Ge and Si by Chemical Hydrogen Plasma Transport." Solid-State Electronics Pergamon Press 1968 vol. 11 pp. 683-684.					
	1P	E. Wiberg et al. "Hydrides of the Elements of Main Groups I-IV" New York 1971 Chapter 6 pp. 443-460.					
	1Q	A.P. Webb "Reactivity of Solid Silicon with Hydrogen Under Conditions of a Low Pressure Plasma." Chemical Physics Letters vol 62 No 1 Mar 15, 1979 pp 173-177.					
	1R	S. Veprek et al. "Parameters Controlling the Deposition of Amorphous and Microcrystalline Silicon in Si/H Discharge Plasmas." Journal De Physique (Paris) 42 C4-251 (1981).					
* EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.							
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## U.S. PATENT DOCUMENTS

Examiner Initials	Item	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
<i>pt</i>	2A	4,609,428	9/2/1986	Fujimara	156	643	7/18/1985
	2B	4,871,580	10/3/1989	Schram et al.	427	38	6/13/1988
	2C	4,874,459	10/17/1989	Coldren et al.	156	643	10/17/1988
	2D	5,003,178	3/26/1991	Livesay	250	492.300	11/14/1988
	2E	5,039,376	8/13/1991	Zukotynski et al.	156	643	8/13/1990
	2F	5,138,169	8/11/1992	Yamazaki et al.	250	398	7/26/1991
	2G	5,145,554	9/8/1992	Seki et al.	156	643	2/22/1990
	2H	5,241,535	8/31/1993	Yoshikawa	370	60	9/18/1991
	2I	5,298,896	3/29/1994	Lei et al.	341	51	3/15/1993
	2J	5,309,232	5/3/1994	Hartung et al.	348	384	7/16/1993
<i>✓</i>	2K	5,331,249	7/19/1994	Minamikata et al.	313	632	12/20/1991

## FOREIGN PATENT DOCUMENTS

	Document Number	Date	Country	Class	Subclass	Translation
						Yes No
	2L					
	2M					

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

<i>pt</i>	2N	S. Veprek et al "Electron-Impact-Induced Anisotropic Etching of Silicon by Hydrogen" Plasma Chemistry and Plasma Processing vol. 2 No 3 1982.
	2O	S. Veprek "Highlights of Preparative Solid State Chemistry in Low Pressure Plasmas." Pure & Appl. Chem. Vol. 54 No. 6 pp. 1197-1220. 1982.
	2P	J.R. Creighton "Hydrogen Chemisorption and Reaction on GaAs(100)." J. Vac. Sci. Technol. A 8 (6) Nov/Dec 1990 pp. 3984-3987.
	2Q	H.P. Gillis et al "Low-Energy Electron Beam Enhanced Etching of Si(100)-(2x1) by Molecular Hydrogen" J. Vac. Sci. Technol B. vol. 10 No. 6. Nov/Dec 1992.
<i>✓</i>	2R	H. Watanabe et al "Electron-beam-assisted Dry Etching for GaAs using Electron Cyclotron Resonance Plasma Electron Source" Appl Phys. Lett 61 (25) Dec 21, 1992 pp. 3011-3013.

\* EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

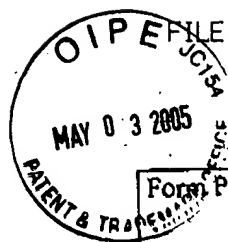
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## U.S. PATENT DOCUMENTS

Examiner Initials	Item	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate
pt	3A	5,352,953	10/4/1994	Wakabayashi et al.	313	631	4/1/1992
	3B	5,368,676	11/29/1994	Nagaseki et al.	156	345	12/9/1993
	3C	5,418,423	5/23/1995	Murray	313	589	10/19/1992
	3D	5,453,305	9/26/1995	Lee	427	562	9/2/1993
	3E	5,457,298	10/10/1995	Nelson et al.	219	121.52	7/27/1993
	3F	5,485,210	1/16/1996	Lim et al.	348	409	6/7/1993
	3G	5,497,053	3/5/1996	Tang et al.	315	366	11/15/1993
	3H	5,556,501	9/17/1996	Collins et al.	156	345	4/1/1993
	3I	5,572,088	11/5/1996	Aizawa et al.	313	491	6/1/1995
	3J	5,606,370	2/25/1997	Moon	348	390	7/11/1995
	3K	5,631,978	5/20/1997	Galand et al.	382	240	5/11/1992

## FOREIGN PATENT DOCUMENTS

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						Yes No
	3L					
	3M					

## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

pt	3N	K. Choquette et al "Hydrogen Plasma Processing of GaAs and AlGaAs" J. Vac. Sci. Technol B. vol 11 No. 6 Nov/Dec 1993 pp 2025-2032.
	3O	H.P. Gillis et al. "Low Energy Electron-Enhanced Etching of Si(100) in Hydrogen/Helium Direct-Current Plasma." Appl. Phys. Lett. 66 (19) May 8, 1995.
	3P	H.P. Gillis et al. "The Dry Etching of Group III-Nitride Wide-Bandgap Semiconductors" Journal of Materials 48 50-55 (1996).
	3Q	H.P. Gillis et al "Low Energy Electron-Enhanced Etching of GaAs(100) In a Chlorine/Hydrogen DC Plasma." Appl. Phys. Lett 68(16) Apr. 15, 1996.
	3R	H.P. Gillis et al "Low Energy Electron-Enhanced Etching of GaN/Si in Hydrogen Direct Current Plasma" J. Electrochem Soc. Vol 143. No. 11 Nov. 1996.

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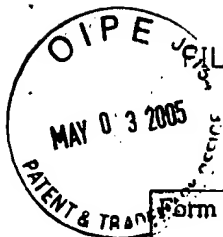
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## U.S. PATENT DOCUMENTS

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<i>P.T.</i>	4A	5,660,744	8/26/1997	Sekine et al.	219	121.43	6/19/1995
	4B	5,882,538	3/16/1999	Martin et al.	216	71	8/28/1996
	4C	5,890,102	3/30/1999	Kossentini et al.	702	181	10/24/1996
	4D	5,917,285	6/29/1999	Gillis et al.	313	632	7/23/1997
	4E	6,033,587	3/7/2000	Martin et al.	216	71	12/3/1997
	4F	6,258,287	7/10/2001	Martin et al.	216	71	9/17/1997
	4G						
	4H						
	4I						
	4J						
	4K						

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						Yes No
	4L					
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## OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, etc.)

<i>P.T.</i>	4N	H.P. Gillis et al "Highly Anisotropic, Ultra-smooth Patterning of GaN/SiC by Low Energy Electron Enhanced Etching in DC Plasma" J. Electronic Mat 26, 301-305 (1997) pp 1-16.
	4O	
	4P	
	4Q	
	4R	

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EXAMINER'S SIGNATURE:

*P. Hassanadul*

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